





4.00
North Branch
Canal

17
STUDY

Finished Canals. 
 Proposed Canals. 
 Finished Rail road. 
 Proposed Rail road. 



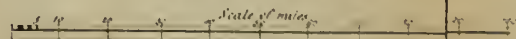
NORTH BRANCH CANAL

and its connections with

PHILADELPHIA, NEW-YORK & BALTIMORE

and also with the

GREAT WEST.



A. 1st or South Anthracite coal field.
 B. 2nd or Middle
 C. 3rd or Wyoming

2.00

REPORT

OF A

LATE RESURVEY AND EXAMINATION

OF THE

NORTH BRANCH CANAL,

SHOWING ITS

PRESENT CONDITION AND PROBABLE REVENUE:

ACCOMPANIED BY

A MAP.

BY WILLIAM B. FOSTER,

CIVIL ENGINEER.

WITH

AN APPENDIX,

CONTAINING A SYNOPSIS OF THE SEVERAL LAWS INCORPORATING THE NORTH
BRANCH CANAL COMPANY;—A VIEW OF THE EXTENDED CHAIN
OF INTERNAL IMPROVEMENTS IT WILL UNITE, ETC.



PHILADELPHIA:

TOWNSEND WARD, 45 SOUTH FOURTH STREET.

1847.

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Crissy & Markley, Printers.  
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NORTH BRANCH CANAL.

AN effort has been making for some time past, for the completion of this important link in the internal navigation of the Atlantic states. A very considerable portion of the stock of the Company incorporated by the Legislature of Pennsylvania for this purpose, has been subscribed by intelligent capitalists, who have entire confidence that it will soon prove one of the most profitable investments which the country affords. To answer satisfactorily the numerous inquiries in regard to this great work, and to exhibit in the most authentic form, its present condition and future prospects, it has been deemed expedient to present to the public the subjoined report.

It is proper to add on the part of the Company, that in the selection of an Engineer to re-examine this Canal, few persons could have been found so well qualified in almost every particular, for the performance of this duty, as the gentleman to whom it has been confided. Besides twenty years experience in the line of his profession—he has had charge of the work in question as principal engineer, for upwards of four years; and his supervision continued three years more, down to the present time, as one of the Canal Commissioners of the State. His experience, and the opportunity thus afforded him for a thorough knowledge of the subject of his report—added to Mr. Foster's well established character, claim for his views the fullest confidence of the public.

Comm. 1 m 8 Trans. 200

p 41707

REPORT

OF THE

COMMISSIONERS OF THE LAND OFFICE
IN RESPONSE TO A RESOLUTION
PASSED BY THE HOUSE OF COMMONS
ON THE 14TH MARCH 1861

IN THE YEAR 1860

BY THE COMMISSIONERS OF THE LAND OFFICE

LONDON: PRINTED BY H. K. GLASS, STATIONER, 15, ABchurch Lane, E.C. 4.
1861

R E P O R T .

HON. GARRICK MALLERY,

PRESIDENT OF THE NORTH BRANCH CANAL COMPANY.

SIR,—In compliance with the request contained in your communication of the 6th of November last, I immediately proceeded to make, in person, a careful re-examination of the North Branch Canal, in its whole extent; and now respectfully submit a report upon the present condition of the work, with estimates of the cost of completion, the probable revenue to be derived from it, together with some other suggestions which are deemed pertinent to the subject.

An union of the valley of the Susquehanna with the great Western Lakes, and opening a convenient avenue for exchanging the rich mineral staples of Pennsylvania for those of New York—entered into the earliest plans of internal improvement presented to the public mind in the Atlantic States. It was embraced also, in the grand and comprehensive schemes adopted both by Pennsylvania and New York; and after being prosecuted to the very verge of completion, was only abandoned under circumstances of the most imperative necessity. In New York, the Chenango and Chemung Canals were both completed avowedly for the purpose of reaching the coal and iron treasures of Pennsylvania; and the North Branch Canal was prosecuted by our State to meet the advances of New York, and designed to unite with one or both those avenues. From 1836 to 1841, the work progressed with great energy; and when, in May of the latter year, the State directed a suspension of work on all the unfinished lines of improvement—there had been expended upon what was termed the “*North Branch extension*,” the sum of *two millions four hundred and eighty-four thousand nine hundred and thirty-nine dollars and sixty cents*!

At the next session of the Legislature of Pennsylvania, after the suspension of this work, the people immediately interested in it, procured the passage of a law authorizing the incorporation of a Company to finish that portion of the line extending from the mouth of Lackawanna to the northern boundary of the State; and subsequently, by a supplement to the original law,—*thirteen miles* of the finished

"Wyoming line," extending from the Lackawanna downward, to the mouth of *Solomon's* creek, four miles below Wilkesbarre, (which had cost the Commonwealth \$550,000,) were added to the work at first proposed to be yielded up by the State; thus offering to capitalists and others interested, works, in which Pennsylvania had invested over *three millions of dollars*, on condition that a sum but little over one million should be expended in their completion!

The extreme liberality of the proposed grant by the State of Pennsylvania, has doubtless, of itself, operated as much as any other cause to produce distrust as to the value and importance of this canal, in the minds of those who have the means and inclination to make investments in such works. Indeed, it is not surprising that, with persons unacquainted with all the circumstances, this should have been the case. That a great state should, after expending more than three millions of dollars, suspend *such a work*, and offer to individuals for a term of forty years, the whole benefit of that investment; agreeing, even if she should resume it at that period, to repay the amount they had expended, and guaranteeing "seven per cent. per annum" upon all the expenditure thus incurred, is a case unparalleled in the exigencies of states, and the history of public legislation.

To account for these extremely liberal propositions on the part of Pennsylvania, let it be remembered that, at the period of suspending her public works, she could not borrow the sum necessary to complete them at any price; that she was increasing her immense debt at the rate of nearly *two millions* a year, by the issue of Certificates of Loan in payment of the semi-annual instalments of interest upon that debt! Under these circumstances, the citizens of the northern counties, whose best hopes of prosperity lay in the completion of the improvements on the Susquehanna, demanded that the Commonwealth should either finish what in its present form was a public nuisance, or give it up to be completed by individual enterprise. The State yielded; and hence the present advantageous charter of the North Branch Canal Company. I proceed now to an estimate of the cost of completing this work, deduced as well from field notes taken at the time I had charge of the line, as principal engineer in the service of the State, as from a recent careful re-examination throughout its entire length.

That portion of the work embraced in the charter, designated as the "Wyoming Line" extending from the mouth of Solomon's creek to the Feeder Dam across the Lackawanna, (a distance of thirteen miles,) is in good navigable condition, with lock-houses and every thing necessary for use. It has been for several years in full operation, and cost the State, as I have before remarked, over half a million of dollars. By a late provision in the charter of the Company, whenever \$100,000 shall have been actually paid in by the stockholders for the purpose of carrying on their work, the State yields immediate possession of the whole line; and the tolls collected upon this part of it, go at once to the benefit of the Company. I estimate the revenue which would thus be immediately derived from

this thirteen miles, to pay at least four (probably six) per cent. on the \$100,000 required to be paid in at the commencement.

Upon that portion of the line extending from the Lackawanna to the Northern boundary of Pennsylvania, a distance of *ninety-four and $\frac{21}{100}$ miles*, (known as the "North Branch Extension") detached sections have been completed, amounting in the aggregate to thirty-two and $\frac{50}{100}$ miles; and upon the remaining distance of sixty-one and $\frac{71}{100}$ miles, more or less work has been done upon almost every mile of it. But the sum required to complete it, compared with that already expended, shows more clearly the amount of work done in proportion to that remaining unfinished.

The dimensions of this canal, as far as it has been completed, correspond with those of the North Branch and Susquehanna Divisions, extending down the river to Columbia; having a width of twenty-eight feet on the bottom; forty feet at the surface, and four feet depth of water. The locks are ninety feet long by seventeen feet wide in the chamber; and the lockage from the mouth of the Lackawanna to the State line, averages but little over *two feet* per mile! Its capacity, when completed, would therefore, be ample to pass one million tons each way, per annum.

ESTIMATED COST.

The following summary statement exhibits the estimated cost of the various descriptions of work yet remaining to be done; the quantities, as before remarked, deduced from the original field notes, and a recent careful re-examination of the line; with prices affixed, sufficiently liberal to cover all contingencies, viz. :—

1 Dam across the Chemung, at Athens, - - -	\$14,767 00
2 Dams across the Susquehanna, - - -	107,252 00
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Total estimated cost of Dams,	\$122,019 00
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9 Aqueducts, three of which are partly built, - -	\$109,718 00
27 Locks and 2 Guard-gates, three of the former being completed, some work done at six others, - -	148,625 00
31 Culverts, ranging from 2 to 24 feet span, - -	35,220 00
1 Towing-path Bridge over the Chemung, \$11,028 00	
1 Do. Do. over small run at Towanda, - - - - -	500 00
84 Road and Farm Bridges over the Canal, of which 24 are either finished or partly so, - - - - -	27,600 00
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Total estimated cost of Bridges,	\$39,128 00
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Amount carried forward,	\$454,710 00

		Amount brought forward,	\$454,710 00
27 Lock-houses,	- - - - -		13,500 00
19 Waste-weirs, five of which are partly finished,	- - - - -		10,000 00
18 water-ways around Locks,	- - - - -		5,400 00
Making Roads where destroyed by Canal,	- - - - -		8,600 00
Making Fence, 15,600 Rods,	- - - - -		11,700 00
Removing Buildings from the line of Canal,	- - - - -		2,400 00
Sections, comprising Excavations of Earth and Rock,			
Embankments, Vertical and Slope Walls, Lining,			
Puddling, &c.,	- - - - -		599,727 00
		Total estimated Cost of completing line,	\$1,106,037 00

The foregoing estimate contemplates a permanent and useful work, dispensing with all ornament, and only providing for what is necessary to make it substantial.

The Dams are designed to be made of round and square timbers, well framed and pinned together, and compactly filled with stone; the slopes to be covered with oak timber, not less than eight inches thick, and well secured to the Dams with iron bolts. The abutments are to be founded at such depths as to render them secure, and to be built of heavy durable stone. At each dam, provision has been made in the estimate, for the construction of a schute, suitable for the safe descent of arks and other river craft.

The Aqueducts will all be upon gravel foundations, and are designed to have heavy stone abutments and piers, resting upon a platform of timber and plank, sunk to such depths as to render them secure from the action of the floods in the several streams, and prevent their undermining. The masonry to be rubble-work, of large durable stone, well bedded and jointed and laid dry. The superstructures to be of wood. In cases where the spans do not exceed thirty-five feet, the trunk will be supported by string pieces laid longitudinally under it; and where the spans are to exceed thirty-five feet, the trunk will be supported by arch and truss work of sufficient strength to bear any weight that may be required.

The Locks are designed to be built with good, heavy, durable stone, laid dry and faced with planks. The composite Lock is best adapted to the circumstances of this canal, as no stone suitable for cut stone locks are to be had, at reasonable cost; while those of a good quality for a composite lock, are easily obtained.

PRESENT CONDITION OF THE WORK.

In reference to the present condition of the unfinished work, it may be said to be in a remarkable state of preservation. The walls and embankments all stand firmly, and the only injury the work has sustained by its suspension, consists in the natural decay of those wooden

portions of the locks, waste wiers, and bridges which were wholly, or in part completed; and at three points on the line, where land slides have broken from the mountain sides and partially filled the canal. This latter source of difficulty, does not exist to near as great an extent, as I had apprehended; and makes but a small item in the estimated amount of work required to complete the line. The points at which these slides are likely to occur, are all now well developed, and by proper care in construction, the line may be so arranged as to avoid for the future, all interruption or difficulty from this cause. The location of this canal is upon a high level; and unlike most other canals in Pennsylvania, will not be liable to injury from the periodical floods in the river. On this point I examined particularly with reference to the flood of March last, which had proved so destructive upon the Delaware, Susquehanna and North and West Branch Divisions of the State canals; and I found, with the exception of the feeder levels, that this, the greatest flood which has occurred for more than *half a century*, had not reached in general, above the plane of canal bottom; and in no single instance had the water passed over the banks of the canal where they were raised to their full height. I feel entire confidence in the opinion, that if this canal had been finished and in use, it would not have sustained damage, by this extraordinary flood in the river, to the amount of \$500, throughout its entire length. This is an important fact in reference to the value of this improvement. While the Delaware Division sixty miles long, was damaged to the amount of twenty-eight thousand dollars, the Susquehanna and Branches one hundred and eighty-six miles, to near sixty thousand, and one hundred miles of the eastern portion of the main line, to the amount of thirty thousand dollars, here we have a line of ninety-four miles, so located and thus far constructed, as to be secure from the highest flood that has occurred within the past sixty years.

Another important fact in reference to the cost of completing the North Branch Canal should not be omitted in the present view. The lands to be occupied, have nearly all been released to the Commonwealth, for the use and occupancy of a canal, to be constructed by, or "*under the authority* of the State of Pennsylvania." This item, often a vexatious and costly one in the construction of public works, is nearly out of the question so far as concerns this work. The few remaining cases, where releases were not obtained, present no serious obstacle in the way of its progress; as the desire of the citizens and owners of lands along the line of this improvement is so strong for its completion, that I do not apprehend the least embarrassment or difficulty from this source.

THE UNFINISHED LINE IN NEW YORK.

The connection of the North Branch Canal with the Chemung Canal of New York at Elmira, being essential to complete the entire

line of inland navigation from Tide water to the great Lakes, and without which, the advantages to be derived from the former would be but partially realized—I have deemed it not improper to briefly notice this work, although not embraced in the charter of the North Branch Canal Company. A survey was made for a canal from the state line to Elmira, in pursuance of an act of Assembly of the State of New York in 1839, by Joseph D. Allen, Civil Engineer; and an estimate of its cost made at the time, and submitted to the Board of Canal Commissioners of that State. I have before me this report of Mr. Allen, in which the distance between the dividing line of Pennsylvania and New York, and the termination of the Chemung Canal at Elmira, is stated by him at seventeen and $\frac{32}{100}$ miles—the Lockage seventy-five feet, and the estimated cost *three hundred and forty-seven thousand six hundred and five dollars.*

I have myself, recently examined the ground along the valley of the Chemung, surveyed by Mr. Allen, and found it very favorable for the construction of a canal. I have also examined the estimates made by him for that work, and have no hesitation in expressing the opinion that they are ample for its completion.

Laws for the incorporation of a Company to construct this connecting link, as also that by the north-east branch of the Susquehanna with the Chenango Canal at Binghamton, a distance of forty miles, have been lately passed by the Legislature of New York, containing very liberal provisions; and no doubt is entertained that one, or both of these connections will be made, as soon as the North Branch Canal Company shall have finished their work.

If, however, neither of these connections should be immediately prosecuted, the North Branch Canal Company should not be deterred from pushing vigorously forward their project; as without either, they would still have a most valuable auxiliary in the New York and Erie Rail Road, now in progress, located within a few rods of the canal, at the State line, and provision has been secured by law, for connecting with it.

Having considered the condition of the work, and the cost of completing it, I shall now proceed to a brief

GLANCE AT THE REVENUE.

The tonnage upon which it must depend for its maintainance, and for producing dividends to its stockholders, will be chiefly mineral, viz.—Anthracite and Bituminous Coal, Iron, Gypsum, Salt, Lime and Limestone. A considerable amount of sawed Lumber, Shingles, Staves and Heading, Merchandize, Agricultural Productions and Miscellaneous Freight, may safely be calculated upon; but as before remarked, the chief dependence for large remunerating dividends, must be the mineral tonnage which it is destined to bear.

The Wyoming coal region is so well known, that it is scarcely necessary to do more than mention here, that the thickness of the

veins, the quality of the coal, and the facilities for mining and shipping it on the canal, are not in any respect exceeded, if equalled, in any other coal region in Pennsylvania. Indeed, as placing these superior advantages beyond all possibility of doubt, it is a fact, that considerable quantities of Wyoming coal are now carried over *two hundred miles*, to tide water, and go into the markets of the Atlantic cities, in competition with coal transported from other regions, but half that distance from the sea board.

If, by opening an avenue from this region, northward, where no other work can possibly enter into competition, (by the terms of their charter, the North Branch Canal Company have the *exclusive* right to the Valley of the Susquehanna, and no such rivalry as that now going on in the Valley of the Schuylkill can spring up,) if, by opening such an avenue, a market can be found for 200,000 tons of coal—it is easily demonstrated, that *in this one article*, we have a sure and reliable tonnage, sufficient to produce *eight per cent.* upon the capital necessary to complete the work in question. In my judgment, the consumption of anthracite coal in the manufacture of salt, in iron foundries and other manufactures, and for domestic purposes, throughout the country bordering on the lakes, west of Utica, inclusive, would amount to much more than this; leaving out of the estimate, the quantities to be shipped at Oswego and Buffalo for the markets on the lakes, in Canada, and for the use of steamboats. An interesting fact is mentioned by S. W. Roberts, Esq., in his Report to the Managers of the Schuylkill Navigation Company, made in 1845, that he had seen burning in a steamboat on the St. Lawrence, Pennsylvania anthracite coal, brought by sea from New York; and that it was preferred to the coal brought from Wales. By the North Branch Canal, when completed, Wyoming coal could be delivered on Lake Ontario, for less than \$5 per ton; how much would then be brought from Wales and New York, by sea?

Dr. F. L. Harris, of Buffalo, in a recent letter states that “about 1000 tons of anthracite coal was consumed in Buffalo last winter, at prices varying from \$10 to \$11 per ton. Several hundred tons were shipped to the West; some of it as far as Chicago. When Ohio (bituminous) coal is employed for manufacturing purposes, anthracite is used in connection with it. Its consumption in Buffalo is increasing, and the reason why it is not more extensively used, is its high price, now beyond the reach of most of our citizens. If the Pennsylvania North Branch Canal be extended to the New York improvements, coal could then be sold here at a profit, at \$6 50 per ton.”

In consequence of the superiority of this species of coal in many branches of manufactures, as well as for the ordinary purposes of fuel, it is difficult to set any limits to the probable extent of its consumption. An intelligent iron-master of Monmouth county, New Jersey, in a late publication describing the “iron mountain” of Missouri which he had visited, mentions that he saw Pennsylvania anthracite used at Springfield, Illinois, one hundred miles north of St.

Louis, which cost two cents per pound, or \$44 80 per ton; and used too, by a "practical man," with advantageous results.

At present, in Western New York, and throughout the thriving and populous region bordering the great lakes, anthracite coal is not in use, except in carrying on a few branches of manufactures. Yet no country needs a substitute for wood, as fuel, more than this. Twenty years since, Governor Clinton, with characteristic sagacity, lamented the failing forests of that beautiful and fertile region, and pointed out the necessity of securing an access to the mineral coal of Pennsylvania. There is now no avenue through which an adequate supply can be procured; but complete the North Branch Canal, and the object is at once attained. This done, and we could at the very least, supply all the country west of Utica, inclusive, comprising a geographical area of more than one-half the State of New York. There being no duty on this description of coal in Canada, it would be introduced there, and find its way through the Welland canal, upon all the upper lakes. I have no doubt when this work shall be completed, Pennsylvania anthracite could be delivered at Buffalo for \$5 50 per ton, and at Oswego, on lake Ontario, for \$5; paying at these prices a better profit, than it now sells for in the Atlantic cities. At Elmira, as will be seen by reference to a schedule in the Appendix, the price would be short of \$3; at Geneva \$3 50; at Syracuse and other salt villages \$4; and so on at Rochester, Utica, Canandaigua and other large towns, so profusely scattered through Western New York—its price would be in proportion to their respective distances from Elmira, and the price here stated for that place. Now, these are but little more than the average prices of seasoned wood in the towns mentioned; and the cost of preparing the wood for stoves, and the expense of additional attendance, is to be added to the account.

Including what would be used in manufacturing establishments, by steamboats, in smith's forges, and for the ordinary purposes of fuel, I feel the utmost confidence that not less than 500,000 tons of anthracite coal would, in a short space of time, find every year a ready sale in the region of country to which I have referred. A Committee of the principal citizens at Geneva, published an estimate ten years since, in which the annual consumption of coal at the salt villages alone, is set down at 30,000 tons per annum. There is now consumed in the salt manufacture at Syracuse and other salt villages, not less than 400 cords of wood per day; and it is brought, in some cases, a distance of twenty and thirty miles.

Nor should the bituminous coal of Bradford county be left out of view. This coal-field is much less known than it deserves. Its position on the north-eastern verge of the bituminous coal region of Pennsylvania, within twenty-five miles of the State of New York, is extremely favorable. The area occupied by it, is not less than one hundred and fifty square miles; and *intermingled with the coal*, are rich deposits of argillaceous carbonate of iron. I have often wondered that a region of this description, should as yet have escaped the

eagle-eye of capital; and that it has not, long ere this, been filled with furnaces and forges. The coal of this field, for every purpose, is said to be equal to any other bituminous coal in the United States. Compared with the ordinary English coal, it contains a much larger proportion of carbon; the former containing 58 per cent., while the average of the Towanda coal is stated to be 68. The volatile matter of the latter, according to an analysis of Professor Johnson, is small if compared with most other coal, of the same variety, in this country; and adds another proof to the position taken by many geologists, that the quantity of volatile matter in bituminous coal, gradually increases as we advance from the Atlantic region, across and beyond the Alleghany, over the great coal fields of the western and north-western States.

In looking at the probable revenue of the North Branch Canal, one of the most important considerations which occurs, is that illustrated by reference to the map; and is also graphically sketched in an able article from the Philadelphia North American, given in the Appendix to this Report. I refer to the extended and unbroken chain of canal navigation, of which it forms a *central and uniting link*; and the immense number of routes and inlets with which it will be connected. Short and isolated improvements are seldom productive; but always, in this country, as well as in Europe, long canals and railways afford the richest returns for the cost and labor of construction. If there be any exceptions to this rule, it is in regard to those lines upon which the coarser minerals are transported. Now it is upon these minerals—coal, salt, iron and gypsum, that the North Branch improvement will mainly rely. It has become common-place to refer to the extraordinary increase in the value of the stock of the English canals engaged in the coal trade. All of them show an enormous advance, equal in some instances to five hundred per centum. In our own country, the Schuylkill Navigation, the Reading Railroad, the Delaware and Hudson, and the Lehigh Canals, have all been constructed solely for the purposes of the coal trade of their respective regions. I may be allowed a brief comparison as to the cost of these improvements, and in some other particulars, with the work now under consideration.

The first went into operation 1828; the tolls received on coal the first year, amounted to only \$9,700. In 1841, after a steady increase each intermediate year, it had reached the sum of five hundred and fifty-seven thousand six hundred and eighty-nine dollars thirty-nine cents! This improvement is 109 miles in length, costing \$4,801,270; an average of \$44,456 per mile. The Reading Railroad, from the same coal region, cost in round numbers, \$8,500,000, or \$90,425 per mile; making the amount expended for the accommodation of the Schuylkill coal trade, \$13,301,270. Yet such is the enormous increase of this trade, both of these works will probably be productive investments.

The Delaware and Hudson Canal was commenced in 1825, and finished in 1829. It is 108 miles in length, to which should be added a railway of 15 miles, having five inclined planes. These improve-

ments cost \$2,910,588, an average of \$23,472 per mile. The amount of coal sent to market by this route, in 1846, was 324,121 tons. The profits of this Company must be very great; and there are doubtless very good reasons why none of its stock can be purchased. I am aware that this Company mines and markets its own coal, as also does the Lehigh Company. But it should be remembered, both Companies have repeatedly declared in their Reports, that could they be assured of a requisite tonnage furnished by others, they would abandon mining altogether.

The Lehigh improvements, (connected in the estimate for the purpose of illustration, with the Delaware Division of the Pennsylvania Canal as far down as Bristol, the whole distance being 152 miles,) cost in the aggregate, \$7,197,206—an average of \$47,350 per mile. By these improvements, 522,990 tons of coal, were brought to market in the year 1846.

The length of the North Branch Canal Company's works will be 107 miles, costing to complete them, only \$1,106,000—*an average of \$10,336 per mile!* And the seventeen miles in the State of New York, where no work has been done, will cost only about \$20,000 per mile.

There is another particular in regard to which, I deem it fair to extend the comparison. In order accurately to compare capacity, as well as to ascertain the expense of transportation on canals, reference should be had to the amount of lockage. In length of line, (in the ordinary sense,) the Delaware and Hudson, the Schuylkill, the Morris Canal, and the North Branch improvements are all about the same; but reduced to a level, allowing twenty feet of lockage to be equal to a mile in distance, which is a fair ratio for crowded canals, the account would stand thus: The Schuylkill Navigation is 108 miles long, and has 588 feet of lockage. Reduced to a level in the above mentioned ratio, and disregarding fractions, it is 137 miles. The Delaware and Hudson is also 108 miles in length, has 1073 feet of lockage; and is therefore equal to 161 miles of level canal. Bringing the Morris Canal into the same category—101 miles in length, with 1674 feet of lockage equals 184 miles of level canal. The North Branch improvement, say 108 miles long, has not more than 200 feet lockage; extended by the same rule, its length is only 118 miles!

I will not take up time in pursuing this comparison with the Lehigh improvements. It must be sufficient for any farther illustration of the value of those canals in this country, which form avenues for the coal trade, to advert to the Delaware Division of the Pennsylvania Canal. It is, so far, the only productive canal (regarding the original cost) belonging to the State of Pennsylvania. It would to-day, sell at public sale for more money than it cost the State; *because it is a coal carrying canal, and connected with the coal region.*

One of the most surprising features in the rapid progress our country exhibits in every department of human enterprise, is the increase in consumption of coal; and especially of the anthracite coal of

Pennsylvania. In 1820, there was taken from the Lehigh coal region 365 tons. Within the past year there has been taken from the same region over 520,000 tons. In 1825, the Schuylkill coal trade, amounted to 6,500 tons. In 1846, it had reached 1,300,000 tons. The aggregate increase in the whole State, is in the same ratio. From 365 tons in 1820, it has amounted to upwards of two million four hundred thousand tons in the year 1846. The increase of the last year over that of 1845, is 370,000 tons, and the supply is short of the demand.

It would swell this report beyond any reasonable limits, to refer in detail, to the trade in iron, salt, plaster and lumber, which the North Branch improvement would facilitate, and which would add largely to its revenue. It must be obvious to every reflecting mind, that an immense increase in the sale of Pennsylvania iron would result from the completion of this work. We could send bar and pig iron from the Susquehanna valley to Buffalo, at a less price than it now costs there, brought from Lake Champlain, a distance of 300 miles; and we could also supply all the country intervening between the Susquehanna and Lake Erie in the State of New York. There being no duty charged upon American iron in the Canadas, we might enter even into those markets. I have been assured by a gentleman residing in the part of the State of New York to which I refer, himself engaged in the iron business, and well acquainted with the subject, that not less than 40,000 tons of Pennsylvania iron would find an outlet annually, through the North Branch route. The boats taking coal and iron into this region, would almost uniformly find return freight in salt, plaster and water lime. On the Schuylkill, on the Lehigh, and on the Delaware and Hudson Canals, very little return freight is afforded. All the country contiguous to the Susquehanna and its branches, would derive their supplies of salt, plaster and water-lime, from the State of New York, through the Susquehanna and North Branch improvements.

I cannot conclude this general view of the probable sources of the revenue of these improvements, without referring to the fact, that lumber, will be for many years an important article of transportation. The citizens of the Northern counties in their memorial to the Legislature in regard to the completion of the North Branch line, say:—"could those who are thus engaged have an easy and safe transportation to an uniform market, (instead of depending on the cold and dangerous freshet of the spring,) without hazard to life or loss of property, they would convey their lumber seasoned and seasonably to the most commanding market. Had the canal been completed during the past season, we hesitate not to say that the State would have received sixty thousand dollars in tolls from lumber which lay over in consequence of no June freshet the last year; and a large portion of which, is now lost forever to the enterprising and hardy owners, by subsequent unprecedented high water. It is estimated in the same memorial, that 60,000,000 feet of lumber annually descend the Susquehanna; and that "the value of shingles

manufactured, is rather more than one third that of boards." Some idea can thus be formed of the amount of tolls which may be received on the North Branch, from the single article of lumber. The sum estimated by the intelligent authors of this memorial, is, of itself, nearly sufficient to pay the annual interest of what it will cost to finish the canal.

Taking into view the peculiar advantages which the work in question will possess, the extent of country it will penetrate, the immense chain of canal communication it will unite—the valuable character, and variety of the trade for which it will form an avenue, I am inevitably led to the conclusion, that it will almost immediately become one of the most productive lines of public improvement in the country; and that in a very few years after its completion, will be crowded with all the tonnage it will bear. I regard it, as an opportunity to capitalists of a safe and profitable investment, such as is rarely to be met with; and as a Pennsylvanian, I regret extremely, the necessity which compelled the State to part with it. I speak thus confidently and earnestly, after the fullest reflection and most careful examination of the subject in every form.

Respectfully submitted,

WILLIAM B. FOSTER, Jr.,

Civil Engineer.

HARRISBURG, January 20th, 1847.

APPENDIX.

To illustrate more fully, some of the views expressed in the foregoing report—it has been thought expedient to give in an appended form, the following articles and tables, which may be relied upon as drawn from the most authentic sources, and collated with the utmost care.

1.—*A Statement of Distances on the North Branch Canal and the connected works in the State of New York, with the prices at which Coal can be delivered at the several points.*

2.—*A Tabular Statement, shewing the increased consumption of Anthracite Coal, from its first introduction to the present time.*

3.—*An editorial article from the Philadelphia North American—giving, in a graphic manner, a sketch of the immense chain of internal improvements which will be united by the completion of the North Branch Canal.*

4.—*A Synopsis of the several laws passed by the State of Pennsylvania —incorporating the North Branch Canal Company, and the Supplements to the same.*

5.—*A Synopsis of the charter of the Junction Canal Company, in the State of New York.*

STATEMENT

Shewing the distances from the Mines below Lackawanna, to various points in the State of New York, where markets will be found for Anthracite; as also the estimated nett value of a ton of Coal delivered at these several points.

From Coal Mines to		State Line,	100 miles,	\$2 55 value of coal per ton.		
Do	do	Elmira,	117	"	2 77	" "
Do	do	Seneca Lake,	140	"	3 00	" "
Do	do	Geneva,	185	"	3 45	" "
Do	do	Montezuma,	206	"	3 66	" "
Do	do	Palmyra,	241	"	4 00	" "
Do	do	Rochester,	270	"	4 30	" "
Do	do	Lockport,	334	"	4 94	" "
Do	do	Buffaloe,	365	"	5 25	" "
Do	do	Syracuse,	240	"	*4 00	" "
Do	do	Oswego,	278	"	4 38	" "
Do	do	Rome,	286	"	4 46	" "
Do	do	Utica,	301	"	4 61	" "
Do	do	Little Falls,	323	"	4 83	" "
Do	do	Schenectady,	381	"	5 41	" "
Do	do	Albany,	411	"	5 71	" "

* Coal used in manufacturing salt would go free of toll from Elmira to Syracuse; and the cost for that object, would be \$3 75 per ton.

COAL TRADE.

A TABULAR STATEMENT, shewing the increased consumption of Anthracite Coal, from its first introduction to last year.

YEARS.	NUMBER OF TONS.	YEARS.	NUMBER OF TONS.
1820,	365	1834,	376,636
1821,	1,073	1835,	560,658
1822,	2,240	1836,	682,428
1823,	5,823	1837,	881,476
1824,	9,541	1838,	739,290
1825,	34,893	1839,	819,327
1826,	48,047	1840,	865,414
1827,	63,434	1841,	842,244
1828,	77,516	1842,	1,108,000
1829,	112,082	1843,	1,268,852
1830,	174,734	1844,	1,627,588
1831,	176,820	1845,	2,012,742
1832,	363,871	1846,	2,338,560
1833,	437,648		

The Philadelphia North American of the 27th of January last, contains the following graphic view of the extent of the chain of internal improvements, which the completion of the North Branch Canal will unite:

“We called the attention of our readers, a few days since, to the importance of completing the magnificent design of connecting the waters of Lake Erie with those of the Susquehanna. The extent and character of the connexions which would, at an expense strangely disproportioned to the importance of the result, be thus effected, are not generally known to our citizens. We avail ourselves of information furnished by an intelligent friend in the northern part of the State, to lay before our readers some facts which we consider worthy their consideration. An inspection of the map of the United States will aid in the illustrations which we are about to present. The Erie Canal of New York lies in the long valley which extends from the Cohoes Falls on the east, to the Irondequoit valley on the west. It is bounded by the highlands that separate it from the Ontario valley on the north, and from the Susquehanna on the south.

Oswego river, the outlet of *fifteen lakes*, is the only stream which penetrates the northern mountain barrier; it breaks over this at an elevation of one hundred feet above Lake Ontario. The southern range is not intersected by a single important stream. These highlands are nearly all of the same altitude, and have numerous depressions. The lowest and most remarkable one, in the southern range, is that in which Chemung Canal is located, between Seneca lake and Chemung river. The summit here is 465 feet above the lake.

From the Cayuga Lake to Hudson river, the lowest depression is the Oriskany valley now occupied by the Chenango Canal. This ridge, bounding, as we have said, the long valley on the south, traverses the country in an undulating line. Its summit is generally from twelve to fourteen miles distant from the Erie Canal, as far west as Onondaga. At the Port Watson summit, the rise is almost entirely within the distance of five miles. From this point, the range we are pursuing, sweeps in a southwesterly direction, and becomes the southern boundary of the Skeneatales, the Seneca, the Cayuga, and the Crooked lakes.

The Susquehanna river, and nearly all the streams flowing into it, rise near the summit of the ridge we have traced. Geologists would term the whole country between this summit and the Susquehanna valley, *table land*—worn by the action of water, through successive ages, into numerous large, and nearly parallel ravines—having, generally, a course north-east and south-west. Through these ravines, or vallies, flow the rivers of the country with a gentle current on their way to the Atlantic, through the valley of the Susquehanna. No one, viewing this part of the State of New York, and tracing the numerous fertile vallies which branch northwardly from that of the Susquehanna, and terminate near long navi-

gable rivers, or within a few miles of the Erie Canal—can avoid being strongly impressed with the simplicity and beauty of the geological structure of the country, and of the numerous facilities for internal trade. We waive, for the present, a particular consideration of the character and extent of this trade—in order to point out here the extent of country, and especially, of already completed lines of internal improvement, which the North Branch Canal would unite.

Turn we once more to the map:—*Havre de Grace, on Chesapeake Bay*. At this point commences the Susquehanna, or Tidewater Canal, which extends to Columbia on the Susquehanna river—a distance of forty-five miles. Here it unites with the Central division of the Pennsylvania Canal, which continues up the river to Duncan's Island. At this place, it branches off, up the Juniata to the Ohio river, at Pittsburgh, in one direction, and ascends the valley of the Susquehanna, in another. The latter is the route we are considering. A wide, well constructed canal is completed and in operation along the Susquehanna to the mouth of Solomon's Creek, three miles below Wilkesbarre. We note this point, for *here commences the line of improvement embraced in the charter of the North Branch Canal Company*. From the mouth of Solomon's Creek up the river some ten miles above Wilkesbarre to Pittston, the canal is also complete and in operation—beautifully and substantially constructed throughout. This part of the finished line, from the mouth of Solomon's Creek to Pittston, including the feeder, is *given to the Company, with all the work on the unfinished portion*, upon terms to which we shall hereafter refer. From Pittston to the northern boundary of Pennsylvania, the Canal is *more than two-thirds finished* by the State; over two millions of dollars having been expended upon it: the distance is ninety miles. Thence up the Chemung river fifteen miles, to Elmira in the State of New York—also unfinished. At Elmira we reach the Chemung Canal, constructed by the State of New York, to the head of Seneca Lake. Here the beautiful Lake itself, narrow, deep and never frozen, is navigated by steamboats at all seasons down to the outlet at Geneva. Thence partly through the outlet of the Lake, and partly by a State improvement, we reach Montezuma, on the Erie Canal. Thus, it will be perceived—when the section between Pittston and Elmira is completed (and the work is already more than half done)—*there will be, through the heart of the two great states of Pennsylvania and New York, an unbroken line of internal navigation—uniting Chesapeake Bay, Lake Erie, Lake Ontario, Lake Champlain, and the Hudson river!*

Now, before we proceed to remark upon the chances of revenue upon our work, let us trace again the line we have pointed out, and mark in detail its numerous connections and inlets, and immense space over which they spread, like arteries in the human frame, diffusing life and energy throughout a great and prosperous country. From Havre de Grace up the valley of the Susquehanna, to the Northern boundary line of Pennsylvania, is about three hundred

miles. From this, through the Seneca lake and by the Erie canal to Buffalo, two hundred and sixty more,—making, in round numbers, this line of communication between Chesapeake Bay and Lake Erie five hundred and sixty miles. Intersecting and lateral to this line, on our way northward from the bay, we have, first, at Columbia, the railway to Philadelphia, eighty-one miles in length. Then, at Middletown, we find the Union Canal connected with the Schuylkill river at Reading, eighty-two miles. From Reading, the Schuylkill navigation, extending some sixty miles farther, makes the line complete from the Susquehanna river to Philadelphia. To resume our route: from Middletown, up the valley of the Susquehanna, we next have, at Harrisburgh, the railway through a part of the fine old county of Lancaster, to the city of Lancaster, thirty-five miles. Crossing to the other side of the Susquehanna from Harrisburg, is the Cumberland valley railway finished to Chambersburg, fifty miles. Still upward, at Duncan's Island, is the line extending up the Juniata, and across the Alleghany to Pittsburgh, two hundred and fifty-eight. At Northumberland diverges the West Branch Canal, running almost to the geographical centre of the State, seventy-three miles. At Wilkesbarre, we meet with the works of the Lehigh Navigation Company, which crossing the Delaware river at Easton, unite with the newly improved Morris Canal, and make the chain perfect from Wilkesbarre, on the North Branch of the Susquehanna, to the city of New York, one hundred and ninety-four miles. At Towanda, Bradford county, a railway near twenty miles in length, penetrates a rich bituminous coal field, with extensive beds of iron ore intermingled, like those near Pittsburgh. At the State line, above Athens, crossing the line of navigation we have been pursuing, is the New York and Erie Railway, four hundred and forty six miles. This point is about equi-distant between the two extremities of that great work—Dunkirk, on Lake Erie, and Tappan bay, on Hudson river.

At Elmira, there is a connection by canal and railway, with the bituminous coal fields of Tioga county, Pennsylvania, fifty miles. From Elmira, our route proceeds by the Chemung canal (which should be enlarged to accommodate the immense trade that will crowd through it when the remainder of the line is completed) to the Seneca Lake, twenty-three miles. This deep, narrow lake stretches some forty miles through a beautiful country, precisely in the requisite direction; and boats are easily transported upon it to its outlet at Geneva; thence partly through this outlet, and partly through an artificial route, (which is also connected with Cayuga lake) to Montezuma, on the Erie canal. From Montezuma to Albany is two hundred and five miles—to Buffalo, one hundred and fifty-nine miles. These two distances make up the entire line of the Erie Canal, connecting Lake Erie and the Hudson; and may also be embraced in the lateral and minute survey we are taking. Between Albany and Buffalo (not overlooking the fact that Albany is united to Boston by an excellent line of railways) we first meet, nine miles from Albany, on our way northward, the Champlain Canal, extending to White

Hall, on Lake Champlain, seventy-six miles. Then at Rome, the Black River Canal unites with the Erie—running eighty-six miles into the northern interior of New York. At Syracuse, the Oswego Canal diverges to Lake Ontario, thirty-six miles. Passing Montezuma, the point where the route to Chesapeake bay unites with the Erie Canal—we next at Rochester, find the Genesee valley canal, extending to Olean Point, on the Alleghany river, one hundred and twenty-two miles. When we arrive at Lake Erie, the almost endless navigation of the great northern lakes is before us. We can reach the ocean through the Gulf of St. Lawrence, or proceed inland to the Gulf of Mexico!

Where, in all the wide world beside, can such an exhibition be found? Where, a country so interlaced with such an extent of artificial internal navigation?

The North Branch Canal is the only unfinished link, that too, *near the centre* of this great chain of improvement; which passes two of the finest anthracite and bituminous coal regions in the Union, and through, also, large deposits of gypsum and lime. The rich salt springs of New York are by its side, and its whole distance is through a thickly populated and fertile country."

SYNOPSIS OF CHARTER.

The original Law of Pennsylvania, authorizing the Governor to incorporate the North Branch Canal Company, provides in substance, as follows:

1st. That Commissioners be appointed to receive the subscriptions (any five of them authorized to act) for 10,000 shares of 100 dollars each.

2d. That when 5,000 shares are subscribed by twenty, or more persons, and one dollar per share paid, the Commissioners to certify to the Governor of Pennsylvania, who shall then issue letters patent, constituting the subscribers a body politic and corporate, with powers to increase the stock to 2,000,000 of dollars, &c.

3rd. The Commissioners to give notice for organizing the Company, by electing out of the subscribers thirteen managers, citizens of Pennsylvania.

4th. The Company authorized to take possession of the North Branch Canal, from Lackawanna creek, in the county of Luzerne, to the State line in Athens township, in the county of Bradford—when 100,000 dollars of the stock subscribed shall be actually paid, &c.

5th. Continues the full enjoyment of all said works to the Company till the year 1885, when the State of Pennsylvania has the privilege of resuming the same by paying the cost of completion, and seven per cent. interest thereon, per annum, from the time of the outlay of the money, &c.

6th. Authorizes the collection of tolls on the completion of each and every ten miles of the said Canal, and only limits those on iron ores and coal to seven and a half mills per ton per mile, leaving all other articles unrestricted as to the rate of tolls to be charged.

7th. That the work should be commenced in one year, and completed within three years from the passing of the act.

In order to obviate some objections which were started in regard to one or two provisions of the original charter, the friends of the improvement obtained a Supplementary Act, approved the 4th of April, 1843—which provides:

1st. That the time be extended for opening Books of Subscription, as well as for commencing and completing the works, till 1844 and 1847, &c.

2d. Grants and gives to the Company, upon its organization, as by section 4th of the original act, **ABOUT SIXTEEN MILES OF FINISHED CANAL**; extending from the Lackawanna creek through Wilkesbarre, to the mouth of Solomon's creek, being all in the coal fields of Wyoming valley.

3d. Requires the Company to construct a navigable feeder up the said Lackawanna creek about four miles.

Subsequently, (on the 16th of April, 1845,) the following very liberal addition was made to the former privileges granted to the Company.

1st. Authorizing a re-opening of the books for subscription to the Stock, and extending the time for commencing the work to 1st May, 1847, and for completing the same to 1st May, 1857.

2d. That when the work was completed to the borough of Athens, the Company to have *exclusive right to construct a canal in the valley of the North Branch, and no other Company should construct a railway.*

3d. Giving the Company the right to borrow \$250,000, after expending \$500,000 on the canal.

4th. Company not to charge *less* tolls than are charged on Pennsylvania Canal.

5th. Not less than eight of the thirteen managers to be citizens of Pennsylvania.

The Act of the 3d of March, 1847, extended the time within which the Company was to commence its work, to the 1st of May 1848.

An Act of Assembly of the State of New York, passed February 26, 1846, entitled "*An Act to incorporate the Junction Canal Company,*" provides in substance as follows:

SEC. 1. Commissioners named in the Act, are authorized to receive subscriptions to the amount of 500,000 dollars, in shares of 100 dollars each. One dollar per share to be paid in at the time of subscribing.

SEC. 2. Whenever 4000 shares shall have been subscribed, the persons subscribing to the stock are made a body politic and corporate, by the name and style of "The President, Directors and Company of the Junction Canal Company," with the several powers and privileges conferred under the revised statutes, of holding stock, and personal and real estate, &c.

SEC. 3d and 4th. The management of the Company to be vested in seven Directors to be chosen annually with the manner of notice and holding of elections, and manner of filling vacancies.

SEC. 5th. The Directors shall choose a President, Secretary and Treasurer, to hold office during the pleasure of the Board; a majority of the Directors to be a quorum; with power to forfeit stock, and collect amounts due on shares.

SEC. 6th. The Directors shall have power to direct the time and place of their meetings; to appoint surveyors, engineers, superintendents, and other artists and officers, and fix their salaries, and direct and control the payment of moneys, &c.

SEC. 7th. Certificates of stock shall be issued, and the manner of their transfer provided for.

SEC. 8th. The Corporation are authorized and directed to construct a canal or slack water navigation, of such suitable width, depth

and dimensions as they may determine, from a point at or near the termination of the Chemung Canal, at or near Elmira in the county of Chemung, through or along the valley of the Tioga river, to the line of the State of Pennsylvania, at or near Athens in the county of Bradford in said State, to connect with the North Branch Canal at or near said point; with power to form and construct all the works incident to, necessary or convenient for constructing, maintaining and repairing such canal or navigation.

SEC. 9th and 10th. Authorizes the purchase and holding of lands and real estate, and provides for the assessment of damages in cases of dispute between the corporators and owners of lands occupied or injured in the progress of the work.

SEC. 11th. Authorizes the entering upon adjacent lands for materials, and provides the manner of assessing damages.

SEC. 12th. Authorizes the receiving of tolls not exceeding the rate of two cents and five mills per mile for every ton weight of the ascertained burthen or capacity of any boat or vessel, laden with or engaged in the transportation of coal, salt or plaster.

SEC. 13. Power to collect tolls, with penalty of forty dollars upon vessels passing without paying tolls.

SEC. 14th. Provides the method of ascertaining the tonnage of boats.

SEC. 15th. Penalty for damage committed upon the property of the Company to four times the amount of that damage.

SEC. 16th. Rule for blowing the horn when a boat is approaching the lock, and penalty upon the corporation for unnecessary detention of a boat.

SEC. 17th. Corporation required to erect bridges over public and private roads, or when canal runs through and divides the grounds of an individual.

SEC. 18th. Directors to keep accounts of monies received and expended, and with the concurrence of the stockholders, to increase the number of shares, if necessary for the completion of the work.

SEC. 19th. Direction to declare dividends.

SEC. 20th. The corporation may not take possession of any private property without the consent of the owner, or giving security to pay the damages as herein directed to be assessed.

SEC. 21st. Legislature may alter or repeal this charter.

An act containing precisely the same provisions has been passed, authorizing a connection between the North Branch Canal at Athens, and the Chenango Canal at Binghamton in the State of New York.



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